(12) UK Patent Application (19) GB (11) 2 121 861 A

(21) Application No 8216728
(22) Date of filing 9 Jun 1982
(43) Application published 4 Jan 1984
(51) INT CL³ E04H 7/02
(52) Domestic classification E1T 2F 5D2 7C2
(56) Documents cited GB 1585176 GB 1042813
(58) Field of search E1T
(71) Applicant Hotcoat Limited (United Kingdom), Eeto House, Gordon Street, Bury, Lancashire BL9 0LS
(72) Inventor Norman Buckley
(74) Agent and/or Address for Service Marks and Clerk, Scottish Life House, Bridge Street, Manchester M3 3DP

(54) **Water tank**

(57) An insulated cold water tank 2 formed as a complete enclosure of generally parallelopiped shape rebated at 10 and 12 has a thick, insulating, outer layer 6 of rigid synthetic foam having reinforcing rib formations 8. Bonded over the whole interior of layer 6 is a one-piece, water proof lining of plastics. Secured to walls of the tank are a water inlet connection 14 leading to a float controlled valve in the tank, a connection 16 for the overflow, and a connection 26 for the water outlet. A hollow neck on the tank wall projects from rebate 10 opposite inlet connection 14. This neck gives access to the tank interior and is closable by a remable screw cap having a small air vent.

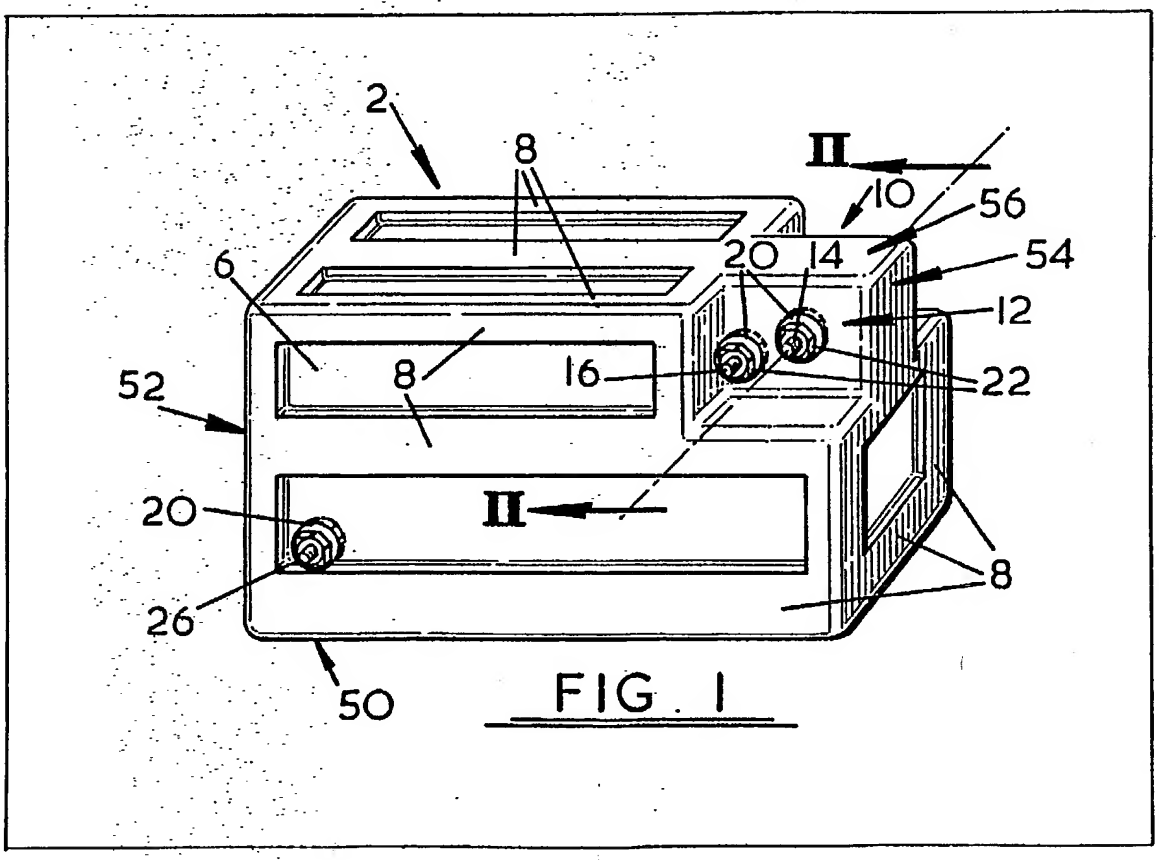

FIG. 1

GB 2 121 861 A

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

2121861

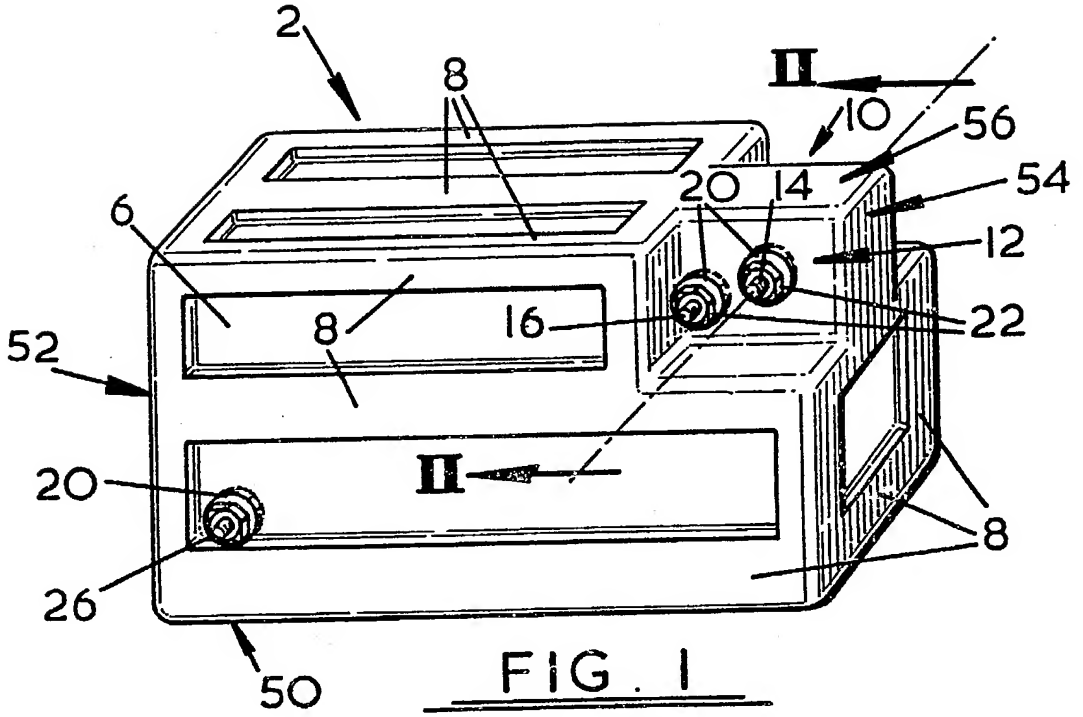

FIG. 1

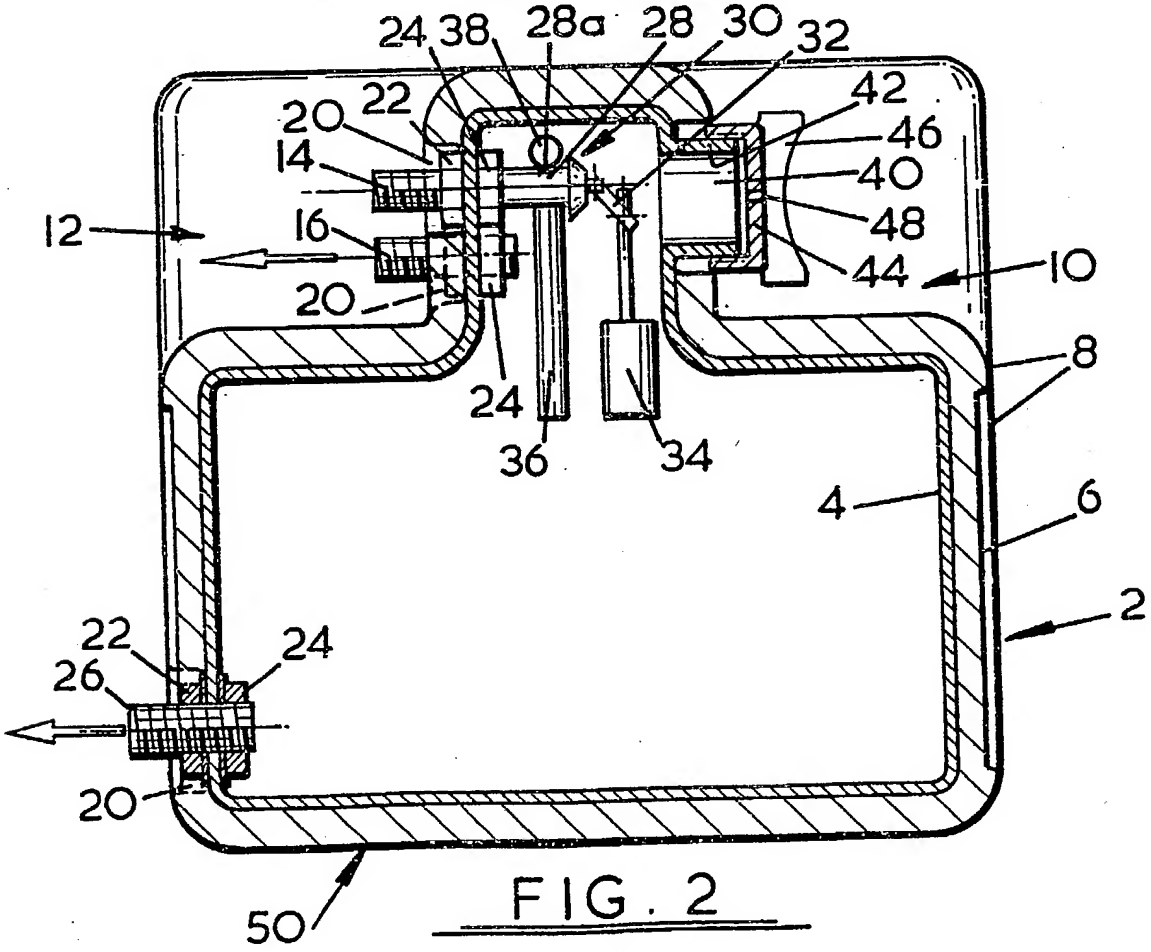

FIG. 2

SPECIFICATION
Water tank

This invention relates to an insulated, cold water tank.

According to the invention an insulated, cold water tank comprises an inner waterproof layer of plastics and an attached substantially rigid layer of insulating synthetic foam externally of the lining.

The plastic lining may be of a one-piece or integral construction either in the initial form of a bag formed from welded plastics film or of a more rigid initial construction defining a container which is substantially self-supporting.

The rigid layer of synthetic foam may be attached to the outer surface of the lining. For example, the foam may be bonded to the lining either by adhesive or by a natural bond between the lining and the foam created during the foam producing process.

The foam layer besides its insulation properties provides structural rigidity which augments the rigidity of a lining of the self-supporting type or maintains a lining of the plastics bag type in an opened-out state.

The foam layer may have reinforcement to increase the structural strength of the tank. The reinforcement may be foam ribs. These may be integral with the layer of foam and may be on its outer surface.

The foam may be moulded around the lining.

The tank may have handles or hand grips.

The handles may be attached to or integral with the lining and extend through the foam, or they may be formed of or in the foam, for example by grooves or recesses therein.

The tank is intended for connection to external piping, for example the usual domestic hot water system. Therefore the tank is preferably manufactured with one or more pipe connection means mounted on one or more of its walls ready for connecting external piping with the tank interior. The connection means may be held in position on the tank by being moulded integrally with or into its wall(s) or by being bonded, clamped or otherwise secured thereto.

When the tank is for connection to any hot water system it may preferably be provided with a valve controlled water inlet, an outlet, and an overflow connection. The inlet, outlet and overflow connection may each comprise an externally screw-threaded tube for coupling in known manner to external pipe-work and for clamping by a known nut arrangement to the tank wall. Preferably this known nut arrangement does not act on the foam (which may be absent from where the tubes emerge) but may clamp against a substantially rigid and non-brittle reinforcement ring or sheet apertured to receive the tube and moulded into the foam and/or mounted or provided on the lining. When the lining is of the self-supporting container type its wall may be sufficiently thick and rigid for the nut arrangement to clamp against opposite faces of the wall.

The inlet valve to which the inlet tube leads may be a known float valve in which, for example, the float is on a pivoting arm. That arm may act on a diaphragm in the valve.

Preferably the tank is formed as a complete enclosure i.e. its top is formed in one-piece with its sides and base except for a relatively small opening leading into the tank interior. This opening may be closed by a cap fitting a neck or collar on the lining. The cap may be a screw-on cap and may have an air vent, or some other form of closure may be provided for the opening, for example a pivoting closure flap or a sliding panel. Preferably the opening is disposed proximate or opposite to the tank wall through which the threaded tubes from the overflow and inlet valve extend. Thus access may be gained to the overflow and inlet valve in the tank through the opening. The closed tank may be of substantially parallelepiped shape with the access opening, overflow and inlet valve at or adjacent the same upper end portion with the access opening at a higher level than the overflow outlet which is above the normal water level controlled by the inlet valve. With such a shape of closed tank it may be mounted by standing it on either its larger side face remote from said upper end portion or on its smaller end face remote from that portion, provided the float valve is adjusted accordingly. Thus there is a choice of attitude in which to mount the tank and so enables the tank to be placed in positions which would otherwise be unsuitable for known tanks.

An upper part of the tank wall may comprise a line of weakness allowing a hole to be formed by cutting, pressing or knocking-out a portion of the wall surrounded by the line. That hole may receive a pipe, for example an expansion pipe.

Amongst its advantages are that the tank may be supplied with the inlet valve, overflow and outlet connections in position all ready for connection to external piping, is light in weight with insulation already integrally provided, and the tank may be formed as a complete or substantially complete enclosure.

The invention will now be further described, by way of example, with reference to the accompanying drawings in which:—

Fig. 1 is a perspective view of a cold water tank formed according to the invention, and

Fig. 2 is an enlarged sectional view on line II—II of Fig. 1.

The closed tank 2 comprises a plastics lining 4 which may be a one-piece moulding and may be of polythene of polypropylene. The lining 4 is surrounded by a thick, insulating layer 6 of rigid synthetic foam, which may be a phenolic foam, adhered to the lining and formed with reinforcing ribs 8 on the surface of the foam layer.

The tank is of generally parallelepiped shape having an upper end part rebated at 10 and 12.

Externally threaded tube parts 14 and 16 are fitted through apertures in wall part 18 of rebate 12. There is a void or opening 20 in the foam around each aperture so that the arrangements of units 22, 24 clamping the tube parts 14 and 16 to

the lining 4 do not damage the foam. Another threaded tube part 26 is like-wise mounted adjacent the opposite corner of the tank. Tube part 26 is for coupling in known manner with outlet piping, and tube part 16 for coupling with an overflow pipe. The tube part 14 is for coupling with water inlet piping and leads into a housing 28 of a known water inlet valve 30, with a diaphragm, operated in known manner by a pivoting arm 32 in response to rise and fall of float 34. The water outlet from valve 30 can be through a flat tube 36 connected to a cross tube 38 having a transverse hollow spigot push-fitted onto a neck 28a housing 28.

An opening 40 in a side wall of rebate 10, opposite the tube parts 14, 16 is defined by a threaded neck 42 on the lining 4. A cap 44 removably screwed on the neck closes the opening. This cap can have an integral handle 46 and an air vent 48.

Removal of the cap gives access to the valve 30, tube part 16 and their nuts 24 inside the tank, and also access, using long tools, to the tube part 26 and its nut 24.

The positioning of tube part 26 near to tank walls 50 and 52 and the location of tube part 16 further from tank walls 54 and 56 than the tube part 14 means the tank in use may sit on its walls 50 as shown, or be upended and sit on its wall 52 provided, in this latter case, the valve 28 is turned through 90° from its attitude in Fig. 2 to suitably position the float.

CLAIMS

1. An insulated, cold water tank comprising an inner waterproof layer of plastics material and an attached substantially rigid layer of insulating synthetic foam externally of said inner lining layer.

2. A tank as claimed in claim 1, in which the tank forms a complete or substantially complete enclosure, and the foam extends substantially completely around the volume bounded by said tank within the interior of the tank.

3. A tank as claimed in claim 1 or claim 2, in which the foam layer is bonded to the lining layer.

4. A tank as claimed in any one preceding claim, in which the foam layer includes reinforcement.

5. A tank as claimed in any one preceding claim, in which the foam layer is moulded over the lining.

6. A tank as claimed in any one preceding claim, in which the inner lining layer is formed by a bag formed of plastics film, or the inner lining layer formed by a substantially self-supporting container.

7. A tank as claimed in any one preceding claim, provided with at least first and second connectors, each connector is affixed to a wall of the tank, and said connectors are adapted to be connected with respective pipes to communicate the latter with the tank interior.

8. A tank as claimed in claim 7, in which the first connector leads to valve controlled water inlet provided in the tank, and the second connector forms a water outlet.

9. A tank as claimed in claim 8, in which the valve is operated by a float within the tank.

10. A tank as claimed in any one of claims 7 to 9, in which a third said connector is affixed to the tank and provides an outlet for water overflow from the tank.

11. A tank as claimed in any one preceding claim, in which the tank is formed with an opening in a wall of the tank, and a displaceable closure is provided whereby the opening can be covered and un-covered.

12. A tank as claimed in claim 11, in which the closure is screw fitted to the tank.

13. A tank as claimed in claim 10 or 11 when either is appended to claim 8 or to claim 9, in which said opening is substantially opposite to the valve controlled water inlet.

14. A tank as claimed in claim 13, in which the tank is shaped with a rebated part which reduces the internal dimension of the tank across the tank interior where said opening opens thereinto.

15. A tank as claimed in claim 8 or claim 9, in which the tank has a first wall adjacent to a second wall, either the first or the second wall can be the base of the tank, and the water inlet is in a region within the tank so disposed that whichever first or second wall in the base said region is adjacent to the top of the tank.

16. An insulated, cold water tank substantially as hereinbefore described with reference to the accompanying drawing.

New claims or amendments to claims filed on 19th July 1983.

Superseded claims 15.

New or amended claims:—

15. A tank as claimed in claim 8 or claim 9, in which the tank has a first wall adjacent to a second wall, either the first or the second wall can be the base of the tank, and the water inlet is in a region within the tank so disposed that whichever first or second wall is the base said region is adjacent to the top of the tank.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1984. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.